

ABSTRACT

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A process for forming a nanoporous dielectric coating on a substrate. The process includes forming a substantially uniform alkoxysilane gel composition on a surface of a  
5 substrate, which alkoxysilane gel composition comprises a combination of at least one alkoxysilane, an organic solvent composition, water, and an optional base catalyst; heating the substrate for a sufficient time and at a sufficient temperature in an organic solvent vapor atmosphere to thereby condense the gel composition; and then curing the gel  
10 composition to form a nanoporous dielectric coating having high mechanical strength on the substrate.